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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • FEBRUARY 26, 1944

March of the Mammoths

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A SCIENCE SERVICE PUBLICATION

ASTRONOMY

Why We Have Leap Year

Called that because every fourth year has an extra day which makes the dates after Feb. 29 fall two days later in the week instead of just one.

➤ EVERY fourth year having an extra day is called Leap Year because during the twelve months following Feb. 29 a date "leaps over" or skips a day of the week, causing dates to fall two days later in the week instead of just one. Whenever the number of the year is divisible by four, with the exception of century years not divisible by 400, an extra day at the end of February is introduced.

The ordinary year of 365 days contains 52 weeks and one day. This extra day causes a particular date to fall one day later in the week than during the previous year. But when there is a leap year, which contains 52 weeks and two days, any date in the twelve months after Feb. 29 falls two days later in the week instead of just one. New Year's day, for example, was on Friday in 1943, and on Saturday in 1944, but in 1945 it will skip Sunday and fall on Monday.

Leap Year was introduced because the earth does not turn on its axis an exact number of times during one entire revolution around the sun. In the Julian calendar, inaugurated by Julius Caesar in 45 B. C., the year was assumed to contain 365¼ days, or 365 days and 6 hours.

The extra hours cannot be included in the year until they have accumulated to a whole day. By the advice of the astronomer Sosigenes, Caesar decreed that the Roman year should consist normally of 365 days, but that every fourth year should contain 366 days.

The true period of the earth's revolution around the sun is 365 days, 6 hours, 9 minutes, 9.5 seconds. This sidereal year is the time taken by the sun to complete the circuit of the heavens from a given star back to the same star.

The year which is used in everyday life, however, is one which depends on the seasons. Because of a slow wobbling motion of the earth called precession, the equinox moves gradually westward and the tropical year, that is, the interval between two successive arrivals of the sun at the vernal equinox, is about 20 minutes shorter than the sidereal year. Its length is 365 days, 5 hours, 48 minutes, 46 seconds. Thus the average year in the Julian calendar was 11 minutes and 14 seconds, or 0.0078 day, too long.

This error of 0.0078 day per year adds up to one day in about 128 years, or causes an error of about three days every 385 years.

In the course of a thousand years the Julian calendar loses nearly eight days. Pope Gregory XIII proposed a calendar reform which would make the date of the vernal equinox the same as in the year 325 A.D., at which time the Council of Nicaea decided upon the method of reckoning the date of Easter.

Between 325 and 1582, the date of the vernal equinox had moved, in the Julian calendar, from March 21 to March 11. The Pope directed that ten days be dropped from the calendar so that the vernal equinox would once again fall on March 21. For people living in Catholic countries the day after Oct. 4, 1582, became Oct. 15. Other countries gradually adopted this change.

Since an error of about three days was introduced every 385 years by the Julian calendar, Pope Gregory XIII decreed that the rule of adding an extra day every fourth year should be followed except in the case of those century years whose number is not divisible by 400. Thus the year 2000 remains a leap year, but 2100, 2200, and 2300 will have only 365 days.

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AERONAUTICS

Helicopter Pilots Must Learn to Fly Tail-First

➤ HELICOPTERS are ideal craft for many of the Coast Guard's regular peacetime tasks, declares Lt. Comdr. F. A. Erickson. (*U. S. Coast Guard Magazine*, February) The uncanny ability of these whirligig flying-machines to slow down and "stand still" in the air, and to climb and descend at very steep angles to blanket-sized landing spots, enables them to carry out such typical Coast Guard missions as close-up inspection of suspicious-looking boats off shore, putting pilots aboard incoming vessels and removing them from outbound ones, removing crews from stranded or foundering ships and from ice floes and other situations of peril, carrying lines aboard them from surface rescue vessels, and transferring supplies and personnel to and from lighthouses, light-ships and other isolated navigational aids.

As evidence of the helicopter's extreme maneuverability, Commander Erickson lists the series of "impossible" stunts through which a helicopter pilot student is required to put his machine at 25 hours of flight training. A few of them are:

Take off sidewise and climb at a 45-degree angle. Come down the same way, but stop and hover a while before setting the ship down.

Take off backward and fly tail-first. At 25 or 50 feet altitude, while continuing flight in same direction, swing tail around and go on nose-first.

From 200 feet altitude, make 60-degree glide and land on marked area approximately 20 feet on a side.

Fly around the boundary of a square, stopping in the air at each corner, without deviating more than one foot, either vertically or horizontally, from true flight line.

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AGRICULTURE

New Weed Mower Has Cutter Bar Across Front

➤ WHEN mowing-machines were first invented, the cutter bar could not be placed directly either in front of or behind the carriage because the only tractive power available, a team of horses, would have trampled down the grass or other plants to be cut before the knives could get at them. So for nearly a century the cutter bar has stuck out to one side.

With gasoline tractor power available this is no longer a necessity, and two Moline, Ill., inventors, L. A. Paradise and W. J. Coultas, have finally taken advantage of that fact, mounting the cutter bar directly across the forward end of the tractor frame. The tractor thus pushes the mowing-machine ahead of it, as an ordinary lawnmower is pushed by a man. The inventors regard their mower as particularly adapted for use in cutting weeds from the sides of highways, its greater compactness rendering it less of a traffic obstruction.

Rights in the patent, No. 2,340,488, are assigned to Deere and Company.

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Porcelain-enameled *carbon steel* is being used in aircraft exhaust systems in place of stainless steel.

ARCHAEOLOGY

Earliest Gilgamesh Epic

Cuneiform writing almost 4,000 years old, deciphered at Pennsylvania museum, is oldest known record of man's longing for immortality.

➤ OLDEST KNOWN written record of man's longing for immortality, a hero's poem or hymn of petition to the great god Utu on behalf of a dead friend, has just been deciphered out of its archaic cuneiform script by Samuel Noah Kramer, associate curator of the University of Pennsylvania Museum. The text and comments on its significance will be published in the forthcoming issue of the *Journal of the American Oriental Society*.

The hero who pleads with the god to grant his friend life everlasting is Gilgamesh, familiar figure in Babylonian mythology. For 70 years, scholars have been piecing together the epic of this great shadowy figure, whose career seems to have been a combination of the stories of Hercules, Samson, Tannhäuser and Parsifal. Most popularized portion of this epic has been the pre-Biblical account of the Deluge.

Now Mr. Kramer has found that there is an even earlier Gilgamesh epic. It was composed by the Sumerians, who lived in the Tigris-Euphrates valley before the Babylonians came and who passed on much of their culture and literature to their alien successors.

For several years, Mr. Kramer has been working over the difficult, often almost unreadable, inscribed clay tablets found buried since about 2000 B.C. in the ruins of Sumerian cities. By piecing various texts together, he has been able to obtain a picture of this pre-Babylonian Gilgamesh, who he finds is very much like his later incarnation, although the narrative of his adventures and exploits is not as consistent and well connected as it is in the Babylonian version.

Gilgamesh's petition that immortality be granted to his dead friend is given in full translation by Mr. Kramer. With a few gaps and uncertain spots rendered inevitable by defects and difficulties in the obscure cuneiform text, it reads:

The lord, towards the mountain of the living man set his mind,
The lord Gilgamesh, towards the mountain of the living man set his mind,
He says to Enkidu, his servant:
"Oh Enkidu . . .
I would enter the mountain, I would set up my name,
In its places where the names (of the gods) have been set up, I would set up my name,
In its places where the names have not been set up, I would set up the names of the gods."

His servant Enkidu answers:
"Oh my king, if thou wouldst enter the mountain,
Inform thou Utu (the sun-god),
Inform Utu, the hero Utu,
Inform Utu, the builder of the mountain,
The hero Utu, the builder of the mountain of the cedar forest."

Gilgamesh took an all-white kid,
A dappled kid as offering he pressed to his breast,
In his hand he placed the silver staff . . .,
He says to the heavenly Utu:

"I would enter the mountain, be thou my ally
I would enter the mountain of the cedar forest, be thou my ally."

Heavenly Utu answers:
"Although thou art . . . for the young, but what wouldst thou in the mountain?"

Gilgamesh answers the heavenly Utu:
Oh Utu, I would speak a word to thee, hear my word,
I would utter a plea to thee, open thy ear.
In my city man has died, oppressed is the heart,
Man has perished, heavy is the heart,
I went up to the wall,
I saw the dead bodies floating on the . . . river,
Now let me not thus; so be it.
Man, the tallest, cannot reach to heaven.
Man, the widest, cannot cover the earth.
I would enter the mountain, I would set up my name,
In its places where the names (of the gods) have been set up I would set up my name,
In its places where the names have not been set up, I would set up the names of the gods."

Utu accepted his tears as an offering,
Like a kindly man, he showed mercy to him.

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ENGINEERING

New Electric Motor Has Speed of 120,000 R.P.M.

➤ A RECORD-BREAKING electric motor, which operates at 120,000 revolutions a minute, has been developed, built and thoroughly tested by the General Electric Company. This new three-horse-power motor weighs only seven pounds and is so small that it will fit into the palm of a man's hand.

The motor is water-cooled and is equipped with oil-mist lubricating bearings. Tests, including a continuous run of eight hours, have proven its perfection, it is claimed.

The ordinary three-horsepower electric motor weighs 105 pounds. The speed of rotation of this new motor is 65 times faster than the conventional motor used in home washing machines and refrigerators. Motors of this type will be used for the grinding and drilling of essential parts of airplanes and other war equipment and will not be available for general use until after the war.

"It's hard to realize speeds of 2,000 revolutions per second in a motor," D. H. Ware, motor engineer of the company pointed out. "However, if the wheels of an automobile could be made to turn at the same speed, the auto would move at the rate of 10,000 miles per hour, or 165 miles per minute. This is about 14 times the speed of sound."

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INVENTION

New Type Bomb Rack Gives Better Control Over Load

➤ A NEW TYPE bomb rack for warplanes is the subject of patent No. 2,342,022, granted to C. G. Trimbach of Eggertsville, N. Y., and assigned to the Curtiss-Wright Corporation. It is designed to give better control over the bomb load, in a number of different ways.

The rack is recessed into the underside of the plane wing, though not necessarily built solidly into it. The inventor prefers a form that can, if necessary,

POCKET-SIZED—This midget motor, but one-fifteenth the size and weight of the average three-horsepower motor, operates at 120-000 revolutions per minute, or 65 times the speed of the motor of a household washing machine. It has been developed by the General Electric Co. for use in grinding and drilling airplane parts and other war equipment.

be jettisoned, whether still loaded or empty. It can even be dumped with its bombs all set to "safe," when preparing to make an emergency landing on a friendly airfield. It is also removable for reloading, so that a plane can be "bombed up" more or less like loading a clip of cartridges into a rifle except for the larger scale of the operation.

Primary feature, however, is the method of delivering the bombs in normal runs over a target. The bombs are loaded on an endless chain conveyor which is moved by a motor under control of pilot or bombardier. They are released one by one as they are brought in line with a bomb chute. The operator can drop them singly, or he can deliver "sticks" or strings in any degree of spacing he desires, by regulating the speed of the motor.

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SOCIOLOGY

Race Prejudice

Is not inevitable and can be eliminated from society. Tendencies which inevitably lead to biased racial feelings could be redirected or suppressed.

➤ RACIAL PREJUDICE is "definitely" not inevitable and can be eradicated from a society, Dr. Scudder Mekeel, of the University of Wisconsin and the Julius Rosenwald Fund, declared to the American Orthopsychiatric Association meeting in Chicago.

A comparison of human societies, he pointed out, shows that not only are individuals modified for getting along in a particular society but that such modification often entails the controlling or almost complete repression of many human tendencies and needs.

Prejudice arises from certain tendencies, he explained. First of all, there is a definite tendency for groups to feel superior to others. At the same time, there is a tendency for aggressions and anxieties to be projected on these "outgroups." Sometimes these are directed against persons within the society as scapegoats.

"However," Dr. Mekeel stated, "it is possible for such tendencies to be redirected or suppressed by society."

He cited Hawaii, Brazil and Russia as societies where racial prejudice is at a minimum.

In our own society and culture, the most significant thing about race prejudice is that it is socially sanctioned and learned. It is a "ready-made and culturally normal outlet for at least mild forms of hostility, fear and superiority."

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Remedy for Race Riots

➤ A METHOD for overcoming prejudice of the intense kind that led to zoot-suit disturbances and race riots in Los Angeles last year was proposed by Dr. Dorothy W. Baruch of that city. Providing better jobs, better housing and better recreational facilities and education of the groups involved are not enough to remedy the situation, she declared.

The terrific hostility born of long periods of frustration and fear cannot so easily be cured. Frequently, as orthopsychiatrists have learned, people cannot use what is provided, whether it be information and education, or a new situation. Actual psychiatric treatment is required.

Both the majority groups and the minority groups, she said, must be helped to do three things: first, to face the fact that they have hostility in them; second, to reduce its violence; third, to handle knowingly left-over hostility that cannot be drained.

From such treatment will come a lessening of guilt, a growth in feelings of personal strength and worth, a lessening of isolation and a growth in feelings of mutuality and belonging. As a result, and only by such methods, Dr. Baruch believes, various peoples could live together safe from unreasoning attack and free to work together toward the building of a new kind of world.

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ORDNANCE

New Semi-Automatic Rifle Has Simple Construction

➤ A SEMI-AUTOMATIC rifle of simplified construction, on which T. F. Horan of New Haven, Conn., received patent No. 2,341,780, is gas-operated, like the Army's model M-1, but instead of having the take-off for the powder gas near the muzzle it has it only a short distance in front of the chamber. The piston has a short stroke, and does not necessarily move parallel with the bore; various alternative means are shown for applying its power to a solid rod-like piece of metal that thrusts backward into the stock, which the inventor calls an inertia member. This unlocks and opens the breech, and at the same time compresses a long helical spring which furnishes the energy for the return stroke that inserts a new cartridge and closes the breech.

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MEDICINE

Aviators May Get Bends

Men required to perform moderate exercise in combat airplanes at altitudes as low as 26,000 feet may suffer from divers' afflictions.

➤ BENDS and chokes, commonly thought of as divers' and sand-hogs' afflictions, may attack aviators as well. Men called upon to perform duties requiring only moderate exercise in combat ships at altitudes as low as 26,000 feet may suffer from bends and chokes, Capt. Cosmo G. Mackenzie and Lieut. Austin H. Riesen of the Greenville Army Air Base, Greenville, S. C., report. (*Journal, American Medical Association,* Feb. 19)

It has generally been supposed that diver's paralysis, often seen after men who work under high atmospheric pressures have returned to the ordinary atmosphere, occurs very seldom if at all at altitudes less than 30,000 feet.

Moderate exercise and delayed elimination of nitrogen from the body in a flight lasting two hours at 28,000 feet produced pains in the bones and lungs, necessitating descent in 36% of the cases. These symptoms occurred in 33% of the men tested at 27,000 feet, in 21% at 26,000 feet, and none at 25,000 feet.

Exercise seemed to be the primary cause of bends at an altitude of 28,000 feet, occuring in 28% of the men tested by moderate exercise alone. A deep, sickening pain was felt, frequently associated with the loss of the use of the affected member of the body.

At an average altitude of 18,500 feet during descent the symptoms of bends disappeared.

There seemed to be no correlation between body build or physical fitness and susceptibility to bends among the group tested. Older men seem to be less susceptible, however, Captain Mackenzie and Lieutenant Riesen report.

All the men participating in these experiments were volunteers from the 16th Altitude Training Unit and represent a fair cross section of Air Corps enlisted personnel. They were all in good physical condition because of daily calisthenics and athletics.

"With the exception of the officers, these men had not experienced nor had they seen bends and chokes prior to the chamber flights," the authors report. "There is no reason to believe that any prejudice existed as to the results or that psychic factors played an important or significant role."

When the desired altitude had been reached, each man did five deep knee bends and extended five times at arm's length a 14-pound high-pressure oxygen cylinder held in the palms. These two exercises were repeated every ten minutes during the flight. The altimeters were covered, except for the first two flights, so that men in the chamber were unaware of their simulated altitude.

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GIANT—This massive tong has a lifting capacity of 80 tons, weighs 12,489 pounds itself and has an opening 69 inches wide. Constructed by Heppenstall Co., Pittsburgh, it was specifically designed for use in handling ingots in a steel plant. The small tong between the claws of the larger one has a lifting capacity of 1,600 pounds.

PUBLIC HEALTH

Navy To Hold Doctors

About one-third of its physicians will be kept from going back to civilian life for some time after the war. Navy has new plan for rehabilitation of wounded.

➤ MEDICAL planning for the future must be based on the fact that the Services will need many physicians for some time after the war, Rear Admiral Ross T. McIntire, surgeon general of the U. S. Navy, declared at the Congress on Medical Education and Licensure held in Chicago under the auspices of the American Medical Association.

If the Navy can give back within the first post-war year two-thirds of the doctors it has taken from civil life, it will be doing well. It will need one-third of them for a long time after that, Admiral McIntire said.

Doctors and medical educators were warned by Admiral McIntire that they have no right to make plans for the finish of the war in less than three years.

By next October, however, Admiral McIntire said, "We will know pretty well where we stand."

Young men being inducted into the Service from now on, he continued, must be able to meet physical requirements for full combat duty, because both Army and Navy plan to use for limited service those who have already seen combat duty and been too severely wounded or disabled to return to it. Their experience makes them of great value for teaching and other limited service activities. The new Navy plan for rehabilitation of the wounded includes an arrangement whereby industrial organizations that will employ the men when they have recovered are teaching them a trade while they are still in the hospital.

Admiral McIntire gave high praise to medical researchers and said that thanks to their efforts malaria control in the Southwest Pacific is now better in hand.

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Relocation of Physicians

➤ AN ANSWER to the question of peace-time distribution of medical care may be found in the wartime experience with relocation of physicians to meet the

medical manpower shortage in different areas, Dr. Harvey B. Stone, of Baltimore, declared at the Congress on Medical Education and Licensure held in Chicago under the auspices of the American Medical Association.

As vice-chairman of the directing board of the War Manpower Commission's Procurement and Assignment Service for Physicians, Dentists, Veterinarians and Nurses, Dr. Stone reported that well over 2,000 physicians have now been relocated.

Some unsolved problems still exist, he said, but added that "on the whole it may fairly be said that this issue which at first seemed so forbidding has met with a large measure of success."

Recruiting physicians for the armed forces has been only one part of the Procurement and Assignment Service's activities, he pointed out. With the aid of the U. S. Public Health Service and the state and county medical societies, areas of "alleged or suspected" medical manpower shortage were investigated and the findings were reported to the central office.

At the same time, the same groups, particularly the field force of Procurement and Assignment Service, were on the alert to find and persuade doctors to relocate. Communities were stimulated to make relocation attractive by arranging for living and office quarters. State licensing boards cooperated by easing the legal difficulties of men moving across state lines. In the future certain financial difficulties will be eased by recent Congressional action in placing a substantial sum of money at the disposal of the U. S. Public Health Service to aid relocations.

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Disease Death Rates Low

➤ DEATH RATES from disease among our present far-flung fighting forces are not only lower than those in World War I but lower than the annual death rate in the Army during any one of the last ten years of peace, Brig. Gen. James Stevens Simmons, U. S. Army, declared at the Congress on Industrial Health held in Chicago under the auspices of the American Medical Association.

We have been able to develop our present great military force with such rapidity and mobilize industrial workers to support it only, he is convinced, because we were armed with efficient methods and facilities for the prevention of disease.

Continued protection of health in this country and abroad, in his opinion, is essential to Allied victory and world recovery. He expressed the hope that eventually, through the development of preventive medicine in its broadest implications, it will be possible to prevent that most pernicious of all diseases, war itself.

The greatest difficulty in developing the Army's health program, he said, was the inability to get enough adequately trained personnel to carry it out. Only 160 malaria control officers were available on the basis of requisite training at the outset of the war. There were only 200 acceptable bacteriologists, only 63 suitable food and nutrition specialists and only 136 biochemists. Many of these could not be called without danger of breaking down the organization needed to protect civilian health.

The Army was obliged, therefore, to give short training courses in various aspects of preventive medicine. After the war, thousands of these men will go back to civil life partly trained for public health work and with great field experience. In addition, a large proportion of the troops will go back convinced of the importance of preventive medicine. As a result, he said, the nation faces a great opportunity to continue the health education of these individuals and to place the public health of the United States on a broader, firmer basis than has been achieved by any nation in history.

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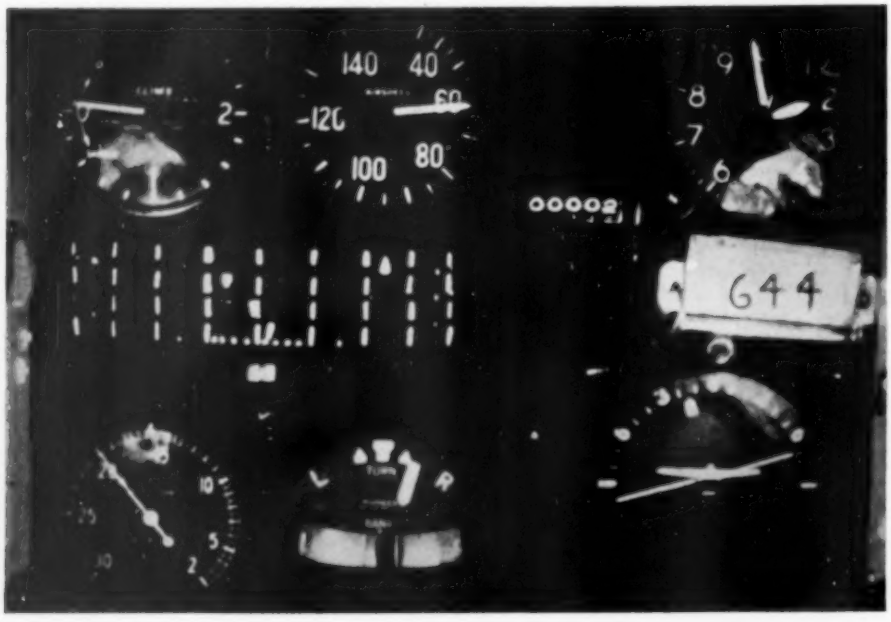

FLIGHT RECORD—In a research program of the new Institute of Aviation Psychology and the Civil Aeronautics Administration, experiments will be conducted to learn just what constitutes a physical handicap in flying. A special movie camera will record the way the student handles his controls, at the same time that a record is made of the actions of the plane. This is a typical photograph of an instrument panel, showing what the plane is doing and the position of the controls at the same time. The instrument in the center at the left shows the position of the throttle, aileron, flipper and rudder by means of small arrows, top to bottom.

AERONAUTICS

4F Men to Be Trained As Flyers in Experiment

➤ CAN 4F men learn to fly? Just what constitutes a physical handicap in flying will be learned experimentally as one of the research programs of a new Institute of Aviation Psychology, soon to be opened at the University of Tennessee.

The Institute will be supported by the U. S. Civil Aeronautics Administration and the Tennessee Bureau of Aeronautics and will be administered by the National Research Council's Committee on Selection and Training of Aircraft Pilots. The committee will have the cooperation of Dr. Dean R. Brimhall, director of research of CAA, and a spe-

CANNED PATTER—Besides the movies taken of the student 4F flyer and his plane's instrument panel (shown in picture on facing page) in the research program of the Institute of Aviation Psychology, records will also be made on a magnetic voice recorder of what the instructor says to the student. The girl above is using a ground model of the wire recorder which also serves as a playback machine for recordings made in the air on the lighter model on the left.

cial project committee of the University of Tennessee.

"Through this Institute, and we hope others like it, we will avoid the unfortunate cessation of basic and practical research in aviation psychology which occurred at the close of the last war," Dr. Brimhall said. "The Institute will be unique in its use of human guinea pigs who, in return for the opportunity of free flight instruction, will be required to take training under conditions which will make it possible to determine the effect of various teaching methods upon the acquisition of flying skill. Some of the student pilots, who will be drawn from residents of Knoxville and vicinity and trained at the University airport, will be men rejected for physical reasons by the armed services. This will provide an opportunity for the exact experimental determination of what constitutes a physical handicap in flying."

A special motion picture camera will be used at the Institute to record the way the student flyer handles his controls and this record will be compared with a simultaneously made record of all the movements of the plane. It will also be compared with what the instructor says to the student, as recorded on a magnetic voice recorder.

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PHYSIOLOGY

Fighting Men Need Water

Cannot be conditioned to exist on only one quart of water daily in desert and jungle warfare. Minimum of 7½ quarts a day is needed on Sahara Desert.

➤ FIGHTING in the steaming tropics or on shadeless desert expanses where the mercury climbs to 100 degrees Fahrenheit or over, men in the armed forces perspire excessively, losing on an average at least seven quarts of water a day. According to old-time theory, men could be hardened to get along under such conditions on as little as one quart of water a day. Present-day research has revealed, however, that no physical conditioning can suppress the water requirement of the body, and that this loss must be fully replaced by drinking water.

How much water our fighting men require for survival is now graphically illustrated in maps prepared by the Research and Development Branch of the Quartermaster Corps of the War Department.

At average temperatures of 82 degrees Fahrenheit and below, where little exercise is involved, one quart of water a day will suffice, the maps indicate. Above that temperature, however, man's requirement increases in proportion to his activity and the relative climatic conditions.

Northern Africa was mapped out for July, its hottest month, in relation to its water requirements. Of this area, the eastern part of the Sahara Desert has the highest recorded temperatures, and a daily minimum of 7½ quarts of water is required there for men engaged in maneuvers. The only hotter place in the world, according to officially recorded temperatures, is Death Valley in California.

Daily water requirements for areas surrounding the Sahara Desert are as follows: for a temperature range of from 94 to 97 degrees Fahrenheit, 6½ quarts; 91 to 94 degrees, 5½ quarts; 87 to 91 degrees, 4½ quarts; 82 to 87 degrees, 3½ quarts.

To determine whether men adrift at sea have a fighting chance to obtain enough rain water to keep them alive until rescued, required rain catchment areas on their rafts and lifeboats have been charted on seasonal maps of the oceans. In some cases, during certain seasons, absence of rainfall in ocean areas completely erases any hopes of survival. These fatal areas include an area along the eastern coast of Africa and the western coast of India, including the Red Sea and the Persian Gulf; and smaller areas off the west coast of South America, and off the West Coast of Australia. During the summer, some parts of the Mediterranean Sea do not receive any rainfall, but because of the relatively small area involved, survivors have a good possibility of reaching land before dying of thirst.

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There is only a little over one ounce of *calcium* in 20 gallons of sea-water, yet out of this low concentration shellfish build their shells.

ORDNANCE

Plastic Hand Guard Invented for Firearms

➤ SEMI-automatic and automatic firearms have given trouble through heating up enough to char and weaken the wooden hand guards that cover the barrels of most military rifles. Obviation of this difficulty is offered in a composite hand guard invented by Max Winer of Medford, Mass., and protected by patent No. 2,341,585. The inner part of this guard, which contacts the hot metal, is made of a heat-resistant plastic, preferably one containing a high percentage of asbestos. The outside is covered with a layer of wood, securely bonded on.

The inventor assigns to the government rights to manufacture and use his device, without payment of royalty.

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MEDICINE

Ivy Poisoning Can Occur In Old World Tropics

➤ SOME of the men in our fighting forces in India and other Old World tropical regions may find themselves having a skin eruption just exactly like the ivy poisoning they might have gotten at home. It may be called dhobie mark dermatitis or some other local name but it is the same sort of condition as ivy poisoning, Dr. E. D. Merrill, administrator of botanical collections at Harvard University and director of the Arnold Arboretum, reports. (*Journal, American Medical Association*, Jan. 22)

A report of 52 cases of dhobie mark dermatitis among American soldiers in India has already appeared. Articles of clothing worn by them had been marked, for identification, with the juice of the marking nut, *Semecarpus anacardium*. Articles so marked are said to be dhobie marked because dhobie is the name for laundrymen in India.

The somewhat caustic juice from the fruit walls of the cashew nut is similarly used, Dr. Merrill states.

The skin trouble can come not only from laundry marks on clothing but from other kinds of contact with certain plant species of the Old World tropics. Men felling certain types of trees, for example, may smear themselves with the sap and if susceptible, they will get the skin trouble just as persons susceptible to poison ivy, poison oak or poison sumac get the poisoning from contact with these plants.

All the species of trees in the Old World tropics which may give trouble belong to the same family as our poison ivy, poison oak and poison sumac, Dr. Merrill states. The active principle that causes the skin trouble is the same in all cases.

Dr. Merrill believes that cases of poisoning by these plant relatives of poison ivy will be rare. If they do occur, the same treatment should be used, he says, that would be given for ivy poisoning at home.

Science News Letter, February 26, 1944

AGRICULTURE—ENGINEERING

Simple Elevator-Conveyor Saves Farmers Man-Hours

➤ TREMENDOUS savings of man-hours in handling grain, soybeans and similar products on short-handed farms can be saved thorugh the use of a simple, easily made elevator-conveyor powered with a one-quarter or one-sixth horsepower electric motor, J. D. Rankin, farm service adviser of the Detroit Edison Company, pointed out at the meeting of the American Society of Agricultural Engineers in Chicago.

It consists simply of boards nailed together to form a flat-bottomed trough, with a cross-cleated canvas belt running through it over wooden pulleys at either end. The speaker gave credit to the agricultural engineering department of Michigan State College for the development of this highly useful farm aid. He said it could move between 200 and 400 bushels of grain in an hour, and "one might elevate 1,000 bushels of oats for the price of a five-cent candy bar or what used to be a nickel cigar."

Science News Letter, February 26, 1944

AGRICULTURE

Pink Bollworm Pest Found In Louisiana

➤ PINK BOLLWORM, one of cotton's worst insect enemies (the other is boll weevil) has been found in parts of Louisiana, the U. S. Department of Agriculture states. This represents a new and menacing sortie; hitherto this pest has been known only from portions of Texas, New Mexico and Arizona.

Because of the immediate seriousness of the situation, extension of quarantine regulations to include Louisiana is under consideration. A hearing to consider the matter has been called, to be held in the Federal Building at Memphis, Tenn., on March 1.

Science News Letter, February 26, 1944

IN SCIENCE

INVENTION

Post-War Pullmans May Be Triple-Decked

➤ WHEN you go a-journeying in that dreamed-of post-war time when travel will again be a permissible pleasure, you can expect to find some radical changes in your Pullman. One type of new car, designated as a "coach-sleeper," will have berths crosswise instead of lengthwise as in the present arrangement, and be triple-decked instead of double.

For such cars Basil E. Jones of Flossmoor, Ill., has invented a sofa-like seat on which he has just received U. S. patent No. 2,338,814, which he has assigned to the Pullman Company.

In its day position, the seat is divided by means of arm-rests to accommodate three persons. The back sections can be inclined separately and at any desired angle to suit the individual passenger's comfort. At night, the arm-rests sink flush with the level of the seat, the back is lowered to full horizontal position, bedding and pillows are arranged—and there's your lower berth.

Science News Letter, February 26, 1944

AERONAUTICS

Blimps Maneuverable Despite Great Bulk

See Front Cover

➤ BLIMPS are frequently likened to elephants; despite their lightness, they somehow seem ponderous. But just as elephants have a kind of heavy agility peculiarly their own, blimps are capable of precision maneuvers when there is occasion for such performances. In the picture shown on the front cover of this SCIENCE NEWS LETTER, nine of the big lighter-than-air craft are shown cruising in line abreast over a valley near the coast of California.

It is not often that blimps congregate in numbers. As a rule they go singly about their job of patrolling the coastal zones for submarines. U-boat commanders hate them because it is possible for a blimp to cut its engines and hover silently, or drift slowly down the wind, giving no warning to the prowlers that have come up for air.

Science News Letter, February 26, 1944

CE FIELDS

ORDNANCE

Heavy Dirt-Pushing Blade Invented for Tanks

➤ EVERY TANK its own bulldozer, is the objective of a newly patented attachment, constructed by Earl B. Maloon of Alhambra, Calif. It consists essentially of a heavy dirt-pushing blade of the familiar bulldozer type, mounted on a pair of long, stout arms that pivot at a point well back on the tank carriage. Power is supplied from the tank's own stout engines, but for raising and lowering the blade there is a separate small gasoline engine running a pressure pump which in turn operates a pneumatic or hydraulic cylinder.

Although the inventor makes no mention of it in his list of claims, a bulldozer blade might be a good addition to a tank's combat armament. There have been stories in the press about unarmed bulldozers attacking enemy pillboxes and demolishing them by a terrestrial equivalent of the old-fashioned naval tactic of ramming. As shown in the patent drawings, the attachment does not interfere with full use of the tank's fire power.

Rights in the patent, No. 2,341,151, have been assigned to the Southwest Welding and Manufacturing Company of Alhambra, Calif.

Science News Letter, February 26, 1944

ENTOMOLOGY

Some Insect Eggs Depend On Moisture for Hatching

➤ INSECT EGGS are often highly dependent on the amount of moisture present in their surroundings, Prof. Daniel Ludwig of New York University told his colleagues at a meeting of the New York Entomological Society.

Some species, like the Japanese beetle, lay eggs that soak up moisture as seeds do, and will not hatch unless they get this extra water. Japanese beetle eggs increase to three times their original weight by such imbibed water.

Prof. Ludwig's principal studies recently have been on the water relations of eggs and pupae of the saturniid moths —those gorgeous big creatures that everyone admires, like the Luna, Promethea and Cecropia moths. Their eggs will take in water from very damp air, but do not need such moisture for their development; they will hatch even in dry air if it is warm enough. However, if the air is either a little too warm or a little too cool, the amount of moisture present will influence the hatchability of the eggs.

As might be expected, there are differences in the behavior of the eggs of different species. Thus, Polyphemus moth eggs will hatch in hotter, drier air than the eggs of other species can endure.

Drying of the pupae during the winter had adverse effects on reproduction after the adult moth emerged in spring, Prof. Ludwig found. In some cases fewer eggs were laid, in others the eggs that were laid failed to hatch.

Science News Letter, February 26, 1944

SOCIOLOGY

Middle Aged Man's Chance Of Remarrying Quite High

➤ FOR MEN at the ages 45 to 49 the chances of remarriage are about three times that for women of the same age, statisticians of the Metropolitan Life Insurance Company calculate from study of marriage and remarriage rates in New England in 1940.

"At the younger ages, the remarriage rates are astonishingly high," they find. "Among women 20 to 24 years of age and among men 20 to 29, each year not far from half of those previously married undertake another marital venture."

Commenting on the speed with which those at younger ages remarry after the first marriage is disrupted, the report states, "the figures lead one to suspect that a considerable proportion of the divorced among these young people may have had plans for remarriage before they broke their earlier partnership."

At the ages beyond 55 years, the ratio of the male to female remarriage rate is about five to one. Although at these older ages the marriage rate among the single is likewise greater for men than for women, the report states that the disparity between the sexes is not nearly so marked as in the case of remarriage.

Reasons given for the higher remarriage rate among men: the widower's need to have someone take care of his home and children; the handicap to the widow of dependent children; the frequent provision in pension and compensation plans, as well as wills, that benefits to the widow end upon remarriage.

Science News Letter, February 26, 1944

ENGINEERING

New Truck Has Half-Track For Travel on Soft Ground

➤ FOUR-WHEELED for fast travel where the going is good, half-tracked for getting over soft ground or up steep slopes, a convertible vehicle developed by Philip W. Sloan of Cleveland is one of the outstanding inventions among the 589 on which new U. S. patents were issued in a recent week.

One novel feature in the design, however, is the application of driving power. The rear wheels never receive any of it. When the vehicle is operating as a four-wheeled truck, power goes to the front wheels only; the rear wheels merely trail along, holding up their end of the load. When it becomes necessary to operate as a half-track, the rear wheels are lifted clear of the ground, and power is then applied to the tractor treads as well as to the front wheels.

Rights in the patent, No. 2,341,883, are assigned to the Linn Manufacturing Corporation, of Morris, N. Y.

Science News Letter, February 26, 1944

INVENTION

Improved Wheat-Peeling Obtained by New Method

➤ AN IMPROVED method for "peeling" wheat, that is, removing the indigestible, corky outer layers of bran without robbing the grain of the proteins in the inner bran, is the subject of patent No. 2,340,313, granted to Theodore Earle of Pacific Palisades, Calif., and assigned by him to the Continental Baking Company.

Peeling wheat is accomplished by what may be described as "gentle violence." The grain is immersed in water to soften the outer coat, then slammed hard against the wall of the vessel to loosen and remove it. This is done by a fast-spinning device known as an impeller. But although the grain is thrown hard, its impact must not be too sharp, so the vessel is lined and the impeller is covered with a thick rubber layer. The "adherescent" impact of the grain gives the rubber sufficient grip to pull the outer bran layers off.

The corky bran, coming loose in large, thin flakes, is floated to the surface and kept continuously skimmed off by a motor-driven skimmer. Subsequently the peeled grain is taken out, dried and prepared for grinding.

Science News Letter, February 26, 1944

ASTRONOMY

Spring Comes on March 20

Will be welcomed by three planets in evening sky. Mars and Saturn pass each other because the orbit of Mars is smaller and nearer the sun.

By JAMES STOKLEY

➤ THREE PLANETS in the March evening sky join with the stars to welcome the coming of spring, which begins at 1:49 p.m., EWT, on Monday, March 20, when the sun on its northward journey in the heavens is directly over the earth's equator.

Two of the planets, both of which we have been seeing for a number of months past, are very close together; indeed, one passes the other. These are Mars and Saturn, both to the west in the constellation of Taurus, the bull. This star group, like the others now visible in the evening, is shown on the accompanying maps. They are drawn to depict the appearance of the heavens at about 11 p.m., war time, on March 1, and 10 p.m. in the middle of the month.

At the beginning of March Mars is west of Saturn, but since it moves in an orbit that is smaller and nearer the sun than Saturn, it moves through the sky more rapidly. Thus, though both planets are traveling in an easterly direction among the stars we see in the background, Mars overtakes Saturn on March 7 at 11 a.m. EWT. At this time, of course, they will be invisible, but on that night, as on the evening of the 6th, they will be very close together. On the maps, they are indicated about as they will be on March 15.

Other Planet Is Jupiter

The other planet is Jupiter, to the southeast, in the constellation of Leo, the lion, near the bright star Regulus. Jupiter, of magnitude minus 2, is by far the brightest star or planet that is visible these evenings. Mars and Saturn are considerably fainter, with magnitudes plus 0.9 and 0.3 respectively. In terms of relative brilliance, Saturn is now about one-and-three-fourths as bright as Mars, but Jupiter is eight-and-one-third times as bright as Saturn.

Planets, of which the earth is one, have no luminosity of their own, but their illumination comes from the sun. The stars, however, are bodies similar to the sun—glowing globes of gas which shine by their own incandescence. They are kept alive, according to modern theory, by a process of transmutation, in which hydrogen is changed to helium in the presence of carbon which is unchanged.

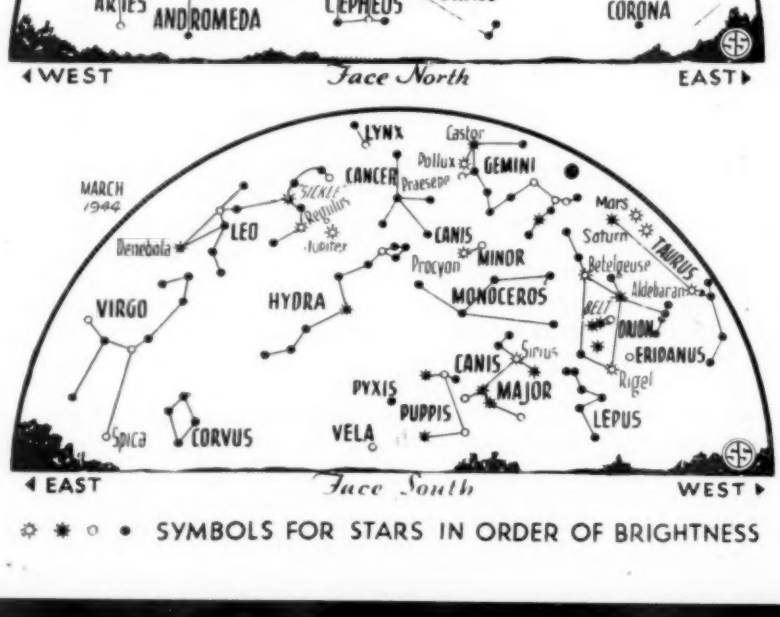
Sirius, to the southwest in Canis Major, the great dog, is one of the nearest stars, and, by virtue of its proximity, is the most brilliant in appearance. Actually, however, it is not particularly bright intrinsically. Far more brilliant in actual candlepower is Rigel, the lower of the two brightest stars in Orion, the warrior, now seen in the southwest. Rigel is below the three stars that form the belt of Orion, while Betelgeuse is above.

Higher in the sky than Canis Major is the lesser dog, Canis Minor, in which Procyon shines. Still higher is Pollux, one of the twins, Gemini. These are hardly identical twins, because Castor, Pollux's brother, is considerably fainter, and does not rate as first magnitude. Another first magnitude star, however, is Aldebaran, in Taurus the bull, seen in the west below Mars and Saturn. And still another is Regulus, in Leo, close to which Jupiter shines.

Arcturus and Spica

Then there are two more toward the east. There is Arcturus, in Bootes, and Spica, in Virgo, the virgin. On the map, Spica is shown by the symbol for a fainter star. This is because, when as low as here indicated, much of its light is absorbed by the earth's atmosphere. Not until it rises higher in the sky do we see it at full brilliance.

As for the planets Mercury and Venus, which have not thus far been mentioned, the former is too nearly in the direction of the sun to be seen this month, though it will come into view as an evening star in April. Venus is now a morning star, rising in the east about



an hour before the sun and not nearly as conspicuous as it was a few months ago.

The ecliptic, the path along which the sun seems to move around the sky from west to east once a year among the stars, passes through 12 constellations which make up the zodiac. The planets, too, stay close to this line. Of the 12 zodiacal constellations—Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpio, Sagittarius, Capricornus, Aquarius and Pisces—Cancer, the crab, is the faintest. On March evenings it is in its best position to view, high in the south, where it is indicated on the maps. It contains no star of the first, nor even of the second or third magnitude. The brightest stars in it are of magnitude four, or about a fortieth as bright as the typical star of the first magnitude.

Praesepe Not a Star

On the map, in the constellation of Cancer, is the name "Praesepe," and near the foot of the initial letter is a small cross. Praesepe is not a star, but a cluster of stars. Its true nature was first realized by Galileo, the Italian astronomer who in 1610 was the first to look knowingly at the heavens with a telescope. In his book, the *Sidereus Nuncius* (*Starry Messenger*) in which he gave his discoveries to the world, he referred to "the nebula called Praesepe, which is not one star, only, but a mass of more than 40 small stars." These can be seen with a pair of opera glasses, or binoculars. Large telescopes reveal several hundred stars.

Called "the Beehive"

A common name for Praesepe is "the Beehive," the origin of which is uncertain. Another is "the Manger," and as such is connected with two nearby stars. One of these is shown on the map as the one from which the several lines of the constellation radiate. The other is a still fainter one, not shown, which is a short distance above. These are called the Aselli—the "asses"—supposed to be feeding from the manger.

Praesepe has long been regarded as a weather portent, for Pliny wrote that "If Praesepe is not visible in a clear sky it is a presage of a violent storm." An ancient Latin poet, Aratos, wrote in similar vein: "A murky manger with both stars" (that is, the Aselli) "shining unaltered is a sign of rain." A curious name that was given to it by the Chinese was "Exhalation of Piled-Up Corpses"!

Celestial Time Table for March

March	EWT	
1	4:40 p.m.	Moon in first quarter.
2	4:16 a.m.	Moon passes Mars.
	8:35 a.m.	Moon passes Saturn.
6	2.59 a.m.	Algol at minimum.
7	7:00 a.m.	Moon passes Jupiter.
	11:00 a.m.	Mars passes Saturn.
8	3:00 a.m.	Moon farthest, distance 252,400 miles.
	11:50 p.m.	Algol at minimum.
9	8:28 p.m.	Full moon.
11	8:37 p.m.	Algol at minimum.
17	4:05 p.m.	Moon in last quarter.
20	1:49 p.m.	Sun crosses equator. Spring commences.
22	11:58 a.m.	Moon passes Venus.
23	6:00 a.m.	Moon nearest, 223,000 miles.
	11:00 a.m.	Neptune nearest, 2,719,000,000 miles.
24	7:36 a.m.	New moon.
	4:39 p.m.	Moon passes Mercury.
29	1:33 a.m.	Algol at minimum.
	6:45 p.m.	Moon passes Saturn.
30	2:19 p.m.	Moon passes Mars.
31	8:34 a.m.	Moon in first quarter.
	10:22 p.m.	Algol at minimum.

Subtract one hour for CWT, two hours for MWT, and three for PWT.

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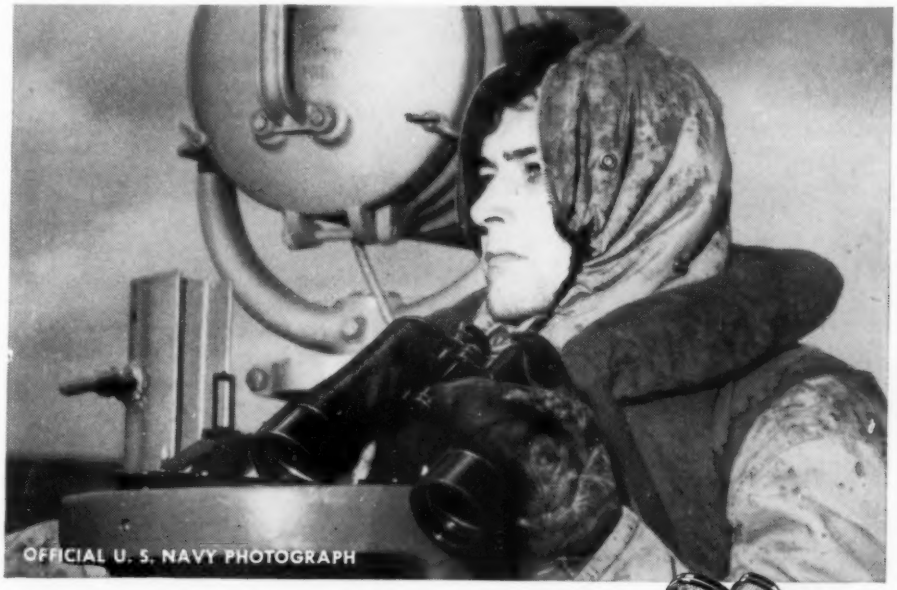
One pound of *aluminum* has the volume of three pounds of steel and one pound of magnesium the volume of about four and one-half pounds of steel.

A *homing pigeon* in the Mediterranean war area flew 20 miles in exactly 20 minutes, the War Department says, quoting the trainer of the bird.


OFFICIAL U. S. NAVY PHOTOGRAPH

BINOCULARS LIKE THIS MUST PASS

a "swimming" test

Bausch & Lomb 7X, 50mm Binocular

Bausch & Lomb developed the first waterproof binocular—a binocular which can be immersed in a tank of water, yet due to its water-tight construction, not a drop of water can get into the interior to fog the optics or interfere with its perfect functioning.

This engineering achievement required a complete redesign of the instrument, complete re-tooling and revised manufacturing procedure. All this was accomplished without interrupting the scheduled even flow of needed binoculars to the armed forces.

Based on this redesign, both the Army and Navy now specify that *all* binoculars supplied to them be of waterproof construction.

Facilities of this plant — developed through 90 years of service to outdoor enthusiasts, to science and industry—are busy today fighting a war. After Victory new miracles of optical science for better living will come from the drafting tables, the glass furnaces and the precision finishing rooms of Bausch & Lomb, optical headquarters of America.

BAUSCH & LOMB

OPTICAL CO. ROCHESTER, N. Y.

ESTABLISHED 1853

AN AMERICAN SCIENTIFIC INSTITUTION PRODUCING OPTICAL GLASS AND INSTRUMENTS FOR MILITARY USE, EDUCATION, RESEARCH, INDUSTRY AND EYESIGHT CORRECTION

Do You Know?

How *lenses* can aid sight was described by Roger Bacon in 1276.

An *iron mine* in New Jersey that supplied ore for the Revolutionary War is now furnishing materials for the present war.

Small *magnets* for electric circuit breakers are now made of powdered iron by the process known as powder metallurgy.

Some 3,000 wildcat *oil wells* are reported to have been drilled in 1943 in the United States in a search for new petroleum reserves.

A *gas pipeline,* now in service 24 years, is made of surplus piping manufactured during World War I for making cannon shell casings.

Acetate *rayon yarn* is replacing war-scarce silk for insulating interior telephone system wires, and is claimed by some to be superior to silk for this purpose.

The Army uses over 25 types of *gloves,* running from mosquito protective canton-flannel hand coverings to heavy reinforced gauntlets for handling barbed wire.

A *medical history* of the war, consisting of photographs and drawings of new surgical techniques and unusual treatment of diseases, is being compiled by the Army Medical Corps.

Some *Labrador natives* practice an ingenious custom of bandaging one eye during the day to preserve it for use at night; the covered eye is adapted for night vision, it is claimed.

Night blindness is one of the oldest disorders known to man; about 4,000 years ago the eating of liver was given as a corrective treatment in the medical papyri of ancient Egypt; liver, which supplies vitamin A, is still recommended.

It has been estimated that the timberlands in southeastern Alaska, if cut on a sustained-yield basis, could produce approximately 1,000,000 tons of newsprint *paper* annually in perpetuity, or about one-fourth of the total consumption of the United States.

MEDICINE

For Penicillin Trial

➤ RHEUMATIC fever, heart-crippling disease of children and young adults, is the next disease against which the power of penicillin will be tried, it appears from a statement by Dr. Chester S. Keefer, of Boston, in charge of clinical research on penicillin for the National Research Council, in an interview following his report to the Congress on Industrial Health sponsored by the American Medical Association.

Whether or not the disease-fighting chemical from mold will be effective against rheumatic fever apparently has not yet been determined. All Dr. Keefer said in answer to a question, was: "It's in the works."

This is not surprising in view of reports at a U. S. Children's Bureau conference last fall that rheumatic fever is becoming a problem in the Army and Navy. The decision as to what civilian patients will be treated with penicillin depends, Dr. Keefer emphasized, on whether the information gained from treating the patients will help men in our fighting forces.

No more penicillin, for example, will be released for treatment of civilian cases of gonorrhea, since its effectiveness in that disease has been established. Penicillin for treatment of gonorrhea now will be limited to the armed forces.

Investigation of the effect of penicillin in rheumatic fever has a bearing on the problem of an almost always fatal form of heart disease, bacterial endocarditis. Trial of penicillin in this disease has so far been unsatisfactory. At present experiments on a limited number of cases are under way, to see whether large amounts of penicillin given over a limited time will have a favorable effect. Until the results of this study are known, no more penicillin will be released for treatment of bacterial endocarditis.

The way to prevent this disease, however, is to prevent rheumatic fever, Dr. Keefer declared. The heart damage done by this disease is what gives other germs a chance to entrench themselves so firmly on the heart valves that neither sulfa drugs nor, so far, penicillin can rout them and save the patient. The rheumatic fever investigations, therefore, may have far-reaching results.

In spite of its spectacular effectiveness in infections with pneumococci, gonococci, staphylococci and streptococci, penicillin is without effect in virus infections, malaria and dysentery and is "probably" without value in the tropical disease, filariasis.

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CHEMISTRY

Penicillin Production

➤ PENICILLIN, doubled and redoubled, seems to be the American bid for a quick win against infection and disease among our fighting men. So rapidly have production facilities been expanding lately, that a good two-fifths of all the penicillin turned out in this country during 1943 was produced in the single month of December.

Thirteen American and two Canadian firms are now manufacturing the germ-killing drug, and within another five months the list of American firms will have grown to 21, the Office of War Information states.

Quantities of penicillin for civilian use will still be extremely limited, however, for Army and Navy requirements absorb the lion's share of total production, and still more is needed. To stretch the limited supply, the Service doctors use penicillin only in cases where the sulfa drugs fail to produce results. If casualty lists go up steeply, even the limited supply now permitted for civilian use may be diverted to the war fronts.

The U. S. Department of Agriculture, whose biologists and chemists have been responsible for many of the improvements in mass-culturing the mold that secretes penicillin, warns against attempts to "produce penicillin in the kitchen." Molds cultured and processed under any but the most critical conditions are very apt to be worthless and may even become dangerous through the growth of "wild" contaminating organisms.

Neither is it correct to say that penicillin is the product of the molds you find growing on spoiled oranges. These usually belong to the genus Penicillium or one of its near relatives, but 99 times in 100 they are not of the right species for the production of penicillin.

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6,300,000 Gallons of Air Raid

...on its way to Berlin

▶ It's easy to see why there's less gasoline in the U.S.A. for civilians.

Also why there's less Ethyl fluid available for your gasoline.

For every gallon of fighting grade aviation gasoline contains a generous portion of Ethyl antiknock fluid. Today, not only is more Ethyl fluid needed for more aviation fuel, but more of it is going into each gallon.

What happens after the war—when most of this high octane gasoline can stay home? You'll have gasoline for *your* automobiles, trucks, buses and farm tractors of higher quality than ever before. And when engines are designed to take full advantage of high-octane fuels, you'll get more work, more power, more economy out of every gallon.

In this post-war development, through its laboratories in Detroit and San Bernardino, the Ethyl Corporation is prepared to play a special part. Though we are not directly engaged in the manufacture of fuels, engines or engine parts, we belong to both the oil and automotive industries. Thus we will be able to cooperate with both groups; to help them unite their individual efforts toward the ultimate peacetime goal of making future transportation better and cheaper.

* * *

ETHYL CORPORATION

Manufacturer of Ethyl fluid, used by oil companies to improve the antiknock quality of aviation and motor gasoline

CHRYSLER BUILDING, NEW YORK CITY

ETHYL BRAND OF ANTIKNOCK COMPOUND — ETHYL CORPORATION

MEDICINE

K.P. Is Good Medicine

AAF surgeons find dishwashing is excellent for a man who has had a broken wrist. Special exercises and games for convalescent soldiers include ward police.

➤ "K.P. IS WONDERFUL for a man with a broken wrist," Lt. Col. Howard Rusk, chief of the convalescent training program, Army Air Forces, Air Surgeon's Office, told a group of newspaper women at a conference in Washington.

Harsh though it may sound, it is good medicine during convalescence because, Colonel Rusk explained, it keeps the man's hands in hot water, which is soothing and healing for such injuries, and wringing out dishcloths gives just the exercise needed to make the wrist supple again after weeks of immobilization in a cast while the bones knit.

Ward police, which involves picking up paper off the floor and similar activities, gives the bending and stooping that doctors have found beneficial in convalescence from back injuries.

One result of the special exercises and games devised for the convalescent training program is that men with broken bones get back to duty after the casts are removed in half the usual time.

As a check on the value of the program, 600 patients recovering from virus pneumonia were divided into two groups. Men in one group were allowed out of bed two days after their temperatures were normal and had the customary convalescent care. Those in the other group were kept in bed 10 days longer but were given the special convalescent training, both physical and mental. Those in this supervised group were back on duty in about two weeks less time than the others, and relapses occurred in only 3%. The relapse or recurrence rate in the unsupervised group was 30%. Scarlet fever patients averaged nine days less in the hospital and measles patients one week less when they had the benefit of this training program.

Important by-products of the program given by Colonel Rusk are: Less danger of blood clots after surgical operations because the exercise increases the blood velocity; 2. Different set given to the soldier patient's morale because through the program he becomes part of the Army again, instead of a lonesome, sick man.

The men are kept busy all the time. When not exercising to keep their muscles in trim, they are learning. Some wards are wired for radio so the men in this line of work can keep up code practice. After two weeks in this ward, it was found that the men were two to five words a minute faster than when they entered the hospital. In some wards flashlights are provided, the wards are blacked out, and the men signal from bed to bed to keep in practice.

Instead of looking at blank ceilings all day, patients in Air Forces hospitals look at model planes strung above their beds which they or their mates have made, and improve their ability to recognize different models. Others learn to make camouflage nets, an art which may later prove life-saving.

The convalescent training program is now being expanded to include vocational rehabilitation for the maimed and crippled. The day after the wounded Air Forces man enters one of the eight centers in the United States for this training, a vocational guidance director sees him and asks what he would like to do and helps him find a job he would like and can do either in the Air Forces or the Air Service Command. The wounded veterans, Col. Rusk declared, do not want pensions but the ability to work and carry on normal lives.

The rehabilitation feature of the program has great post-war possibilities for civilians. Labor and management, Col. Rusk believes, should get together to provide vocational rehabilitation for civilians who, through accidental injury or sickness such as heart disease, cannot go back to their former jobs. A good vocational rehabilitation program would save these men from the miserable state of living as invalids on the reduced standard necessary even when they have pensions.

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CHEMISTRY

Synthetic Menthol Can Be Produced from Thymol

➤ SYNTHETIC menthol which resembles natural menthol in its chemical structure can be produced commercially from thymol. Drs. H. B. Hass and A. L. Barney of Purdue University developed the new method of producing menthol artificially.

The synthetic menthol has the same taste and odor as natural menthol, they report to the American Chemical Society, and pharmaceutical differences, if any, are slight. The new process is one of distillation, beginning with thymol hydrogenated to a complex mixture of alcohols and ketones. Menthone is produced first, and this is then reduced to synthetic menthol.

Thymol is found in oil of thyme, of which there is no particular shortage at the present time. Natural menthol is found mainly in the Orient.

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FORESTRY

NATURE RAMBLINGS

by Frank Thone

Dodging Destruction

➤ SNOWSHOE HARES should be consulted before planting pines and other conifers on areas to be reforested in northern states. This is not a recommendation for a return to ancient oracular practices; it is purely a matter of statistics.

The recommendation comes from Clarence M. Aldous of the U. S. Forest Service and Shaler E. Aldous of the U. S. Fish and Wildlife Service, and is one of the results of a five-year study of problems connected with getting new forests to grow where old ones have vanished, in the Lake States area. (*Journal of Forestry,* February)

The snowshoe hare, species found only in the North, gets its name from its oversize hind feet, which enable it to lollop along on top of loose snow. It was not regarded as a serious nuisance until about a generation ago, when its habit of nipping off the buds and young shoots of planted conifers in areas where reforestation was being undertaken began to cost real money.

Like a good many wild mammal species, the snowshoe hare has its ups and downs. At about ten-year intervals, its numbers build up to a peak, remaining high for three or four years. Then something, apparently an obscure disease, causes a very rapid dying-off, after which the population remains at a low point for half-a-dozen years, until the upturn in the cycle returns.

Significant harm to plantations of young trees is done only during the periods of greatest population, the two investigators found. Control measures such as shooting and trapping, while locally effective, are too expensive to attempt over large areas. They therefore recommend that planting programs be held up during the cyclic upswings, and pushed vigorously during the times when the hare population is low. Then, by the time it again reaches a maximum, the trees will have grown tall enough to keep their heads out of harm's way.

Science News Letter, February 26, 1944

INTERNATIONAL OPPORTUNITY IN SCIENCE

A highly qualified woman teacher of general science is wanted immediately in the leading American-sponsored private school for girls in Chile. The cash salary offered is lower than customary in the United States, but school provides board and room in beautiful surroundings, medical and dental care, and transportation down and back, as well as opportunity for work with highly selected student body in exceptionally fine institutions. Three-year contract. For particulars, write the Association of Schools in Latin America, American Council on Education, 744 Jackson Place, Washington 6, D. C.

Books of the Week

➤ DEEPLY BURIED in ancient bogs are the records of the climates that prevailed during the years of their slow filling up. For the climates determined the nature of the forests in the vicinity, and the forests shed pollen on the mud and shallow water, year after year; so that now a properly trained botanist can accurately describe long-vanished forests by peering through his microscope. This branch of paleoecology looks easy but isn't: how to master its difficulties and avoid its pitfalls can be learned from AN INTRODUCTION TO POLLEN ANALYSIS (*Chronica Botanica,* $5), by G. Erdtman, Swedish master of this tedious but rewarding technique.

Science News Letter, February 26, 1944

➤ DESPITE Scriptural admonition to the contrary, we are nowadays giving much thought to what we shall eat. And despite need for utmost intelligence in choosing from war-limited supplies, we let habit, and even prejudice, sway us overmuch in our purchases of food. Persuasions to better sense pop out (though with no obvious evangelism) from the pages of MAN'S FOOD, ITS RHYME OR REASON (*Macmillan,* $2.50). The author, Mark Graubard, brings a double array of resources to bear on his task: he is both nutritionist and anthropologist.

Science News Letter, February 26, 1944

Just Off Press

ANTHROPOLOGICAL PAPERS — Bureau of American Ethnology—*Gov. Print. Off.,* 615 p., illus., $1, paper, Bulletin 133.

ANTHROPOLOGICAL PAPERS—Bureau of American Ethnology—*Gov. Print. Off.,* 375 p., illus., 75c., paper, Bulletin 136.

CHROMESOMES AND PHYLOGENY IN CREPIS: III. The Relationships of One Hundred and Thirteen Species—E. B. Babcock and J. A. Jenkins—*Univ. of Calif. Press,* 51 p., 75c., paper.

THE CONTRIBUTION OF HOLLAND TO THE SCIENCES—A Symposium Edited by A. J. Barnouw and B. Landheer—*Querido,* 373 p., illus., $3.50.

THE ELECTRICAL CRAFTS—William H. Johnson and Louis V. Newkirk—*Macmillan,* 146 p., illus., $2.50.

GRAPHICAL CONSTRUCTIONS FOR VACUUM TUBE CIRCUITS—Albert Preisman—*McGraw-Hill,* 237 p., illus., $2.75.

THE HELICOPTERS ARE COMING—C. B. F. Macauley—*Whittlesey House,* 161 p., illus., $2.

OUR AMERICAN BABIES: The Art of Baby Care—Dorothy V. Whipple—Barrows, 367 p., illus., $2.50.

PHYSICS: Course 1, Mechanics, 352 p., illus. Workbook 124 p., $1.50 paper; PHYSICS: Course 2, Heat, Sound, and Light, 345 p., illus. Workbook, 103 p., $1.50, paper; PHYSICS: Course 3, Electricity, 314 p., illus. Workbook, 76 p., $1.50, paper; *Henry Holt.* These companion books are adapted from Modern Physics by Charles E. Dull and are identical with the edition published for the U. S. Armed Forces Institute.

THE RADIO AMATEUR'S HANDBOOK—Staff of the American Radio Relay League—*American Radio Relay League, Inc.,* 480 p., illus., $1, 21st ed., paper.

SPHEROGRAPHICAL NAVIGATION — Dirk Brouwer, Frederic Keator and D. A. McMillen—*Macmillan,* 200 p., illus., $5.

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•New Machines and Gadgets•

❁ *CIGARETTE conserver, now patented, is a non-inflammable container into which partially used cigarettes may be inserted and snuffed out by a cover placed over the open end. The cigarette retains its natural flavor until the smoker is ready for the remaining half.*

Science News Letter, February 26, 1944

❁ *ELECTRONIC spray gun, used in a radio tube factory to paint metal tubes, squirts out paint only when a tube is directly in front of the gun. A switch powered by an electronic tube does the trick as the tubes to be painted pass the gun on a conveyor belt.*

Science News Letter, February 26, 1944

❁ *SERVICE LIFE of a machine-lathe is lengthened by flame refining the cast-iron bed-ways of the lathes to the maximum allowable hardness. Fully hardened steel strips are used for carriage facings. The combination of materials is claimed to increase the service life as much as 50 per cent.*

Science News Letter, February 26, 1944

❁ *WOOD pattern-makers now use a cutting tool operated by compressed air similar to the so-called compressors used in rock drilling and mining. Patterns for molds for foundries are turned out more*

quickly by this means than with ordinary hand chisels. The picture shows one in use.

Science News Letter, February 26, 1944

❁ *A SPECIAL COATING can now be applied to the interiors of booths and conveyors used in spray-painting that eliminates the tough job of scraping off over-spray paint. By using this coating the over-spray is stripped off in sheets.*

Science News Letter, February 26, 1944

❁ *OXYGEN TENTS for tiny premature babies are made of transparent plastic. They look like ordinary covers placed over food dishes to protect them from dust and moisture. A meat cover borrowed from the hospital kitchen was the first tent of this particular material used in this way.*

Science News Letter, February 26, 1944

❁ *TINY WASHERS made of glass fibers bonded and pressed into wafer-like mats are used in lip-microphones in the armed services. They remain resilient, exert even pressure on the metal diaphragm of the "mike" under combat conditions, and prevent thunderous battle noises from interfering with clear transmission.*

Science News Letter, February 26, 1944

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 196.*

Question Box

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MEDICINE

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SOCIOLOGY

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